DOCUMENT RESUME

ED 038 229 RC 004 259

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TITLE	Prediction of Delinquency, Adjustment, and Academic Achievement Over a Five Year Period with the Kvaraceus Delinquency Proneness Scale.
SPONS AGENCY	Public Health Service (DHEW), Washington, D.C.
PUB DATE	5 Mar 70
NOTE	18p.; Paper presented at annual meeting of National Council of Measurement in Education (Minneapolis, Minnesota, March 5, 1970)
EDRS PRICE	EDRS Price MF-$0.25 HC-$1.00
DESCRIPTORS	Behavioral Science Research, *Delinquent Identification, Delinquents, *Discriminant Analysis, *Followup Studies, *Predictive Validity, Tables (Data), *Testing
IDENTIFIERS	*Kvaraceus Delinquency Proneness Scale

ABSTRACT

The Kvaraceus Delinquency Proneness Scale (KD Scale) was developed as an instrument designed to aid in prediction of future juvenile delinquents. The purpose of this research was to evaluate the predictive validity of the instrument over a 5-year period. Indexes of delinquency adjustment and academic achievement served as the validational criteria. The specific questions investigated were (1) Are there differences between children who are delinquency-prone and children who are not in terms of delinquency, personal and social adjustment, and academic achievement? (2) When added to a group of known delinquency preditors, do the KD Scale totals or derived subscores yield a significant increment in predictive efficiency? Overall the results indicated that the KD Scale seems to be useless as a predictor of delinquency as represented in contacts with law-enforcement agencies, but it does have some predictive power in the areas involving personal and social adjustment and academic achievement. Also, it seems to be that, at best, only parts of the KD Scale add to the prediction of delinquency. A related document is RC 004 260. (DK)

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ED038229

Prediction of Delinquency, Adjustment, and Academic Achievement over a Five Year Period with the Kvaraceus Delinquency Proneness Scale[1]

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[1] This investigation was supported by Public Health Service Research Grant No. ROl MH 17641-01 from the National Institute of Mental Health.

[2] A paper presented at the annual meeting of the National Council of Measurement in Education, Minneapolis, Minnesota, March 5, 1970.

RC004259

The purpose of this research was to evaluate the predictive validity of the Kvaraceus Delinquency Proneness Scale (Kvaraceus, 1950) over a five-year period with indexes of delinquency, adjustment, and academic achievement serving as the validational criteria. Kvaraceus argued in 1956 that there are few reports of true prediction studies. He asserted that the true prediction study is one in which delinquency instruments are administered; predictions are made for the individuals in the sample; time is allowed during which the behaviors under study might occur; and finally the relationship between predictions and actual behavior is determined. Ten years later Kvaraceus (1966a) echoed his statement of 1956 in describing the need for true prediction studies (p. 93) and lamented the emphasis on studies of concurrent validity of delinquency indexes wherein prediction data and the criteria of delinquent behavior are secured simultaneously. While the cross-sectional study permits some inferences about changes in the predictors and the delinquency criteria over time, it is not to be considered a true prediction study as advocated by Kvaraceus.

Kvaraceus (1966, p. 90) listed seven instruments which have some validity for the prediction of delinquency. One of the seven is actually a combination of two instruments, the Kvaraceus Delinquency (KD) Proneness

Scale and the KD Proneness Checklist. The KD Scale has been more widely researched than the Checklist and presumably there is substantial evidence on its validity.

Rothney (1959) reviewed the KD Scale and concluded that it is a ". . . crude survey device of questionable stability and of unknown prognostic value (p. 151)." He also concluded that there was no evidence of predictive validity but that the KD Scale would discriminate institutionalized delinquents from "high morale" high school students.

Rose (1967) reviewed delinquency prediction instruments and concluded that the KD Scale probably has no predictive validity. He asserted that many of the KD Scale items probably discriminate social class more than anything else. While social class may be related to delinquency, its value as a predictor has not been established.

Conrad observed in 1950 that the true test of the predictive validity of a new instrument is to test its prediction power in a battery of known or established predictors. While the KD Scale has been used in much research, apparently no one has given it the acid test which Conrad (and many measurement specialists after him) have asserted is essential. All of these reviews lead to three major conclusions: (1) some concurrent validity has been established for the KD Scale, (2) research on the predictive validity of the KD Scale is severely limited, and (3) no one has attempted to use the KD Scale with multivariate procedures along with other known predictors in a battery.

The specific questions, then, investigated in this research are: (1) Are there differences between children who are delinquency prone and children who are not delinquency prone according to performance on the KD Scale in terms of delinquency, personal and social adjustment, and academic

achievement assessed five years after the original administration of the KD Scale? (2) When added to a group of known delinquency predictors, does the KD Scale total or its derived subscores yield a significant increment in predictive efficiency?

Method

A special nomination instrument was prepared and submitted to all the public and parochial teachers of grades three, six, and nine throughout an entire county in Wisconsin. Each teacher was required to nominate the two boys and two girls who were most socially disapproved and the two boys and two girls who were most socially approved in his classroom. A "socially approved" child was described by such terms as: "Industrious, productive, good-natured, ambitious, cooperative, truthful, and performs required tasks on time." A "socially disapproved" child was defined as: "Disrupts class, bullies others, has temper tantrums, is overly dominant, is tardy or absent without excuse, talks back, lies, and is cruel."

The teacher was also required to check on a list of eighteen aggressive and disruptive behaviors those which were displayed habitually or persistently by each child she nominated. These eighteen problem categories were as follows: is quarrelsome, is sullen, is rude, is defiant, is resentful, steals, lies, is destructive, disrupts class, is a bully, has temper tantrums, is overly dominant, talks back, is cruel, is tardy or absent without excuse, uses profanity or obscenity, fights with other pupils, is deceptive.

A total of 982 youngsters was nominated as socially approved and a total of 568 as socially disapproved during the two school years of 1961 and 1962. From this pool of 1550 youngsters, a sample of 384 children was drawn randomly for intensive study during the period of 1961 to 1964. They were selected

so as to insure equal representation according to classroom behavior as socially approved or disapproved by the teacher nomination; grade level as three, six or nine at the time of nomination; home location as urban or rural; and as boys or girls. Each of the youngsters and their parents were interviewed by a trained social worker; and three psychological tests - the KD Proneness Scale, a situation exercise test, and a sentence completion form - were administered to each child individually. Each child was rated for delinquency proneness using the Glueck social factors for delinquency. Data on academic achievement, intelligence and adjustment were secured from school records. The results of the research through 1965 are reported in Classroom Behavior: Background Factors and Psycho-Social Correlates (Thurston, Feldhusen, and Benning, 1964) and Delinquency Proneness and Classroom Behavior (Feldhusen, Thurston, and Benning, 1965).

Accordingly, the following data, secured in 1961 or 1962, were thus available as predictors:

1. Classroom behavior as socially disapproved or socially approved according to teacher nomination.
2. Group intelligence test scores from school records.
3. Delinquency proneness score on the KD Scale.

   On the basis of a content analysis of the KD Proneness Scale, six subscores were identified as follows and used as predictors:

   a. Score on items of the KD Scale which relate to school (Area 1).
   b. Score on KD Scale items which relate to failure, fear, misconduct, and aggression (Area 2).
   c. Score on KD Scale items which relate to peer relations and recreation (Area 3).
   d. Score on KD Scale items which relate to occupations and the future (Area 4).

e. Score on KD Scale items which reflect personal preferences (Area 5).

f. Score on KD Scale items which relate to family, adults, and control of behavior (Area 6).

4. Score on teachers' ratings of nine low aggressive traits: rude, sullen, quarrelsome, resentful, steals, lies, tardy or absent without excuse, uses profanity or obscenity, and deceptive.

5. Score on teachers' ratings of nine high aggressive traits: bullies, destructive, fights, disrupts, defiant, has temper tantrums, overly dominant, talks back, is cruel.

6. Composite score for the five Glueck Social Factors for Predicting Delinquency based on family interviews by a trained social worker, psychologist or teacher (Glueck and Glueck, 1959).

7. Adjustment score based on the child's responses to a story involving a child who was caught cheating in school (Situation I).

8. Adjustment score based on the child's responses to a story involving a child who is blamed unfairly (Situation II).

9. Adjustment score based on the child's responses to a story involving a child who is affronted socially (Situation III).

10. Adjustment score based on the child's responses to a story involving a child who has a conflict with a parent over a clothing purchase (Situation IV).

11. Sentence completion score based on a 20-item scale developed for this project.

12. Chronological age at a fixed point in time for all youngsters nominated.

13. Reading achievement as assessed with a standardized test.

14. Arithmetic achievement as assessed with a standardized test.

Detailed descriptions of the data listed above are available in reports by Thurston, Feldhusen and Benning (1964), Feldhusen, Thurston and Benning (1965) and Benning, Feldhusen, and Thurston (1968).

In 1966 a follow-up of the 384 children who had been studied in 1961 was undertaken. Data on police and sheriff contacts were secured from the appropriate law enforcement agencies and were tabulated as follows:

1. One police contact
2. Two or more police contacts
3. One sheriff contact
4. Two or more sheriff contacts
5. One combined (police or sheriff) contact
6. Two or more combined (police or sheriff) contacts

Follow-up data for children nominated in 1961 were secured in 1966 and for 1962 nominees in 1967.

The analyses of personal and social adjustment involved ratings by their teachers in 1966 or 1967 on the following:

1. popularity
2. initiative
3. leadership
4. adjustment
5. cooperation
6. appearance
7. responsibility
8. courtesy
9. integrity
10. total social adjustment

Teacher grades in English, science, mathematics, and social studies and scores from the Sequential Tests of Educational Progress (STEP) for reading, writing, social studies, science and mathematics were secured from school records for the original third and sixth graders who had been nominated in 1961 or 1962 and who were now, five years later, finishing grades

eight or eleven. For youngsters who were in ninth grade in 1961 or 1962 and who were consequently out of school five years later, rank in graduating class constituted the criterion academic achievement score. The latter score was first converted to a percentile in which the 99th percentile represented the top or first rank of achievement. These percentile scores were then converted to arcsin equivalents to make them suitable for use in the subsequent analyses.

For the first analyses of the predictive power of the KD Scales, high and low KD scores were identified using the dividing line minus 5 and down for low scores (not delinquency prone, NDP) and minus 4 and up for high scores (delinquency prone, DP). For original third and sixth graders, teacher grades were available for 101 high and 96 low scorers; STEP scores were available for 55 high and 57 low scorers. For the original ninth graders, data for percentile rank in high school graduating class were available for 50 high and 47 low KD scorers. Social adjustment scores were available for 221 of the original sample of 384. Data on the presence or absence of law contacts were available for the entire sample of 384 youngsters.

Chi-square analyses were used in analyses of the effect of KD score level (high or low) on frequency of law contact. Two-way analyses of variance were used to analyze effect of KD score level and sex on adjustment and achievement.

For the prediction of delinquency with the KD Scale scores and other established predictors, multiple discriminant function analyses with a stepwise program were calculated (Cooley and Lohnes, 1964). The 1961 subjects were used in analyses to derive prediction equations, and 1962 subjects were used as a cross-validation sample.

Results will be considered significant when alpha equals .05. Results will be reported for the main effect of delinquency proneness and sex by delinquency proneness interaction.

Results

Law Contacts

The results of the chi-square analyses of law contacts of DP and NDP youngsters, reported in Table I, revealed no significant differences.

Adjustment

Analyses of variance of personal and social adjustment for DP and NDP youngsters on the KD Scale are presented in Table 2. Five of the nine F ratios for the personal social adjustment scores for KD Score level are significant at the .05 level. All of the nine adjustment means for NDP youngsters exceed the means for DP youngsters. The F ratio for total social adjustment (5.82, 1 and 217 df) is also significant with a mean for NDP youngsters of 64.01, for DP 59.52.

Four of the nine F ratios for KD by sex interaction for the adjustment subscores are significant. The F ratio for the interaction term for total adjustment (5.49, 1 and 217 df) is also significant at the .05 level. This significant interaction is due to the large difference between DP and NDP males (63.07 - 53.17 = 9.90), while the difference between DP and NDP girls is small and not significant (65.08 - 64.88 = 0.20).

Teacher Grades

The analyses of achievement as reflected in teacher grades of DP and NDP youngsters are presented in Table 3. One interaction of KD by sex was significant for mathematics grades (f = 4.14, 1 and 193 df). DP boys had a significantly lower mean, 1.70, than NDP boys, 2.18, but the difference between DP and NDP girls was not significant.

STEP Scores

The analyses of STEP scores for the DP and NDP groups are also presented

in Table 3. The main effect of KD score level is significant only for STEP reading (F = 4.31 1 and 108 df). DP youngsters had a mean of 43.64, NDP of 47.46.

The interaction of KD level by sex was significant for all other STEP scores (Fs of 7.10, 4.20, 7.73, and 4.87; 1 and 108 df). For STEP writing, DP boys had a significantly lower mean, 26.52, than NDP boys, 33.20, but the difference between DP and NDP girls was not significant. For STEP social studies scores, the mean for DP girls, 44.34, was significantly higher than the mean for NDP girls, 38.30. The difference between DP and NDP boys is not significant, 39.61 - 42.37 = -2.76.

For STEP science scores, the analysis revealed an interaction of KD level and sex which is significant at the .01 level (F = 7.73, 1 and 108 df). Again, the difference between DP and NDP boys is not significant, but DP girls had a significantly higher mean STEP science score, 34.44, than NDP girls, 28.44.

Analyses of STEP mathematics scores for DP and NDP youngsters, as reported in Table 3, resulted in an interaction of KD level and sex which is significant, 4.87 (1 and 108 df). The mean for DP boys, 23.78, was significantly lower than the mean for NDP boys, 29.67. The difference between girls was not significant.

Rank in Class

The analyses of high and low KD scorers at the ninth grade level are also reported in Table 3. The main effect of KD level is highly significant (F = 27.55, 1 and 93 df). DP youngsters had a significantly lower mean percentile rank in graduating class, 39.46, than NDP youngsters, 69.51.

Multiple Discriminant Function Analyses

A total of 139 youngsters evaluated in 1961 was available for the analyses to develop the prediction equations. In the step-wise program, variables are entered one at a time according to the strength of their relationship to the criterion. In these analyses group membership as "two or more law contacts" or "has had fewer than two contacts" was the criterion to be predicted. Thirty youngsters had had multiple contacts. As each variable is entered to the equation in this statistical procedure an F test is run of the power of the variable. The following is the order of the admission of significant variables to the equation, the F test at the step of its admission, and a probability statement based on the F test.

STEP	Variable	F	P
1	Teacher Nominations as aggressive disruptive or socially approved	24.35	.01
2	IQ	7.38	.01
3	KD area 5 Score	7.08	.01
4	Chronological Age	4.03	.05
5	High Aggressive Traits	4.92	.05

The KD Scale total score entered the equation at step number 18 of the 20 with an F value of .03, which is not significant.

With all 20 predictor variables in the equation the generalized Mahalanobis D-square for the function is 69.76 which is significant at the .01 level. When the specific predictions for each youngster in the 1961 sample were calculated it was found that of the 30 youngsters who had multiple contacts, 27 were correctly predicted, 3 were not. Of the 109 who had fewer

than two contacts with law enforcement agencies, 86 were correctly predicted while 23 were not. When the same equations were applied to the 1962 sample 22 of 32 youngsters who had multiple law contacts were correctly predicted while 75 of 105 youngsters who had had none or only one law contact were correctly predicted.

Summary and Discussion

The first question asked in this research was: Are there differences between children who are delinquency prone and children who are not delinquency prone according to performance on the KD Proneness Scale in terms of delinquency, personal and social adjustment, and academic achievement assessed five years after the original administration of the KD Scale? For the delinquency index of multiple contacts with law enforcement agencies the answer is emphatically no.

For personal and social adjustment there were a number of significant main effects of KD or interactions of the KD score level with sex. When interactions were significant it was because of high differences between DP males and NDP males. The main effect for KD level was significant for cooperation and responsibility while the interaction was significant for popularity, adjustment, courtesy and integrity. It would seem that the KD Scale might be a better predictor of personal and social adjustment than delinquency.

For teacher grades none of the main effects of KD level was significant; and only one interaction of KD level by sex was significant. DP boys were doing less well than NDP boys in mathematics.

For STEP scores there was one significant main effect and four significant interactions. The main effect was for reading. DP youngsters scored lower than NDP youngsters. For the other STEP scores the significant

interaction indicated a large difference between DP and NDP males in writing and mathematics. For social studies and science the difference was chiefly in DP and NDP females, with the former group scoring higher than the latter.

For rank in graduating class the KD level was a good predictor. DP youngsters graduated at far lower levels than their NDP peers.

Overall the KD Scale seems to be useless as a predictor of delinquency as represented in contacts with law-enforcement agencies but to have some predictive power in areas involving personal and social adjustment and academic achievement.

The second question of this research asked whether or not, when added to a group of known delinquency predictors, the KD Proneness Scale total score or its subscores yielded a significant increment in prediction efficiency? The answer is, of course, to be expected on the basis of answers to question number one. The KD total score does not add a significant increment to the discriminant function for predicting delinquency. Other predictors yielded a far better than chance prediction, which stood up well in cross validation. However, one subscore, based on a set of KD items, all of which relate to personal preferences, is the third predictor variable to enter the function; and it is a significant addition. Thus, the answer seems to be that, at best, only parts of the KD Scale add to the prediction of delinquency.

In conclusion, it should be noted that the analyses related to the second question do not represent generalizable methods for delinquency prediction. Meehl and Rosen (1955) pointed out that prediction studies which use preselected samples that are not representative of the population from which the samples are drawn may not yield valid prediction equations. It is obvious that the delinquency rate in the general population is not as high as in the

sample used in this study. However, in this study, the purpose was not to develop valid prediction equations, it was to test the KD scale within a battery of predictors. For this latter purpose, the approach used in this research was legitimate.

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Table 1

Chi-Square Analysis of Law Contacts of Youngsters
Who Were Classed as Delinquency Prone or Not Delinquency Prone According to Their Scores
on the KD Proneness Scale

Group	N	1 Police Contact	2 or More Police Contacts	1 Sheriff Contact	2 or More Sheriff Contacts	1 Combined Contact	2 or More Combined Contacts
Delinquency Prone	158	19	19	9	2	19	22
Not Delinquency Prone	226	16	22	7	1	17	23
Delinquency Prone Males	71	11	17	9	2	11	20
Not Delinquency Prone Males	121	11	18	6	1	14	18
Delinquency Prone Females	87	8	2	0	0	8	2
Not Delinquency Prone Females	105	5	4	1	0	4	5
Males	192	22	35	15	3	25	38
Females	192	13	6**	1**	0	12*	7**
Delinquency Prone Males	71	11	17	9	2	11	20
Delinquency Prone Females	87	8	2	0**	0	8	2**
Not Delinquency Prone Males	121	11	18	6	1	14	18
Not Delinquency Prone Females	105	5	4	1	0	4	5

** Chi-square significant at .01 level
* Chi-square significant at .05 level

Table 2

Analyses of Variance and Means for Personal and Social Adjustment Scores of Boy
Who Were High or Low in Delinquency Proneness According to the
Kvaraceus Delinquency Proneness Scale

Source	df	Popularity Fs	Initiative Fs	Leadership Fs	Adjustment Fs	Cooperation Fs	App
1 - KD	1	6.32 *	3.75	3.37	5.49 *	4.98 *	
2 - Sex	1	5.18 *	19.44 **	3.71	4.04 *	10.33 **	
1 x 2	1	9.64 **	2.83	2.84	9.66 **	1.78	
Error Mean Square	217	2.39	4.42	3.94	3.67	3.93	
Group	**N**	**Mean**	**Mean**	**Mean**	**Mean**	**Mean**	
DPM	54	5.89	5.04	4.70	5.67	6.17	
DPF	64	6.97	6.73	5.64	7.05	7.36	
NDPM	55	7.07	6.07	5.65	7.09	7.13	
NDPF	48	6.85	6.81	5.69	6.75	7.60	
DP	118	6.47	5.96	5.21	6.41	6.87	
NDP	103	6.97	6.42	5.67	6.93	7.35	
M	109	6.49	5.56	5.18	6.39	6.65	
F	112	6.92	6.77	5.66	6.92	7.46	

** Significant at .01 level
* Significant at .05 level
M = male, F = female; DP = Delinquency Prone; NDP = Not Delinquency Prone

Table 2

...onal and Social Adjustment Scores of Boys and Girls
...Delinquency Proneness According to the
...elinquency Proneness Scale

...rship ...s	Adjustment Fs	Cooperation Fs	Appearance Fs	Responsi-bility Fs	Courtesy Fs	Integrity Fs	Total Fs
37	5.49 *	4.98 *	0.85	5.72 *	3.44	5.12 *	5.82 *
71	4.04 *	10.33 **	4.97 *	10.12 **	10.00 **	13.86 **	12.12 **
84	9.66 **	1.78	3.88	1.80	4.41 *	5.44 *	5.49 *
94	3.67	3.93	3.41	4.98	4.59	4.58	234.18
...an	Mean	Mean	Mean	Mean	Mean	Mean	Mean
70	5.67	6.17	6.91	5.76	6.52	6.52	53.17
64	7.05	7.36	7.92	7.09	8.00	8.22	64.88
65	7.09	7.13	7.64	6.89	7.67	7.85	63.07
69	6.75	7.60	7.67	7.42	7.94	8.21	65.08
21	6.41	6.87	7.46	6.48	7.32	7.44	59.52
67	6.93	7.35	7.65	7.14	7.80	8.02	64.01
18	6.39	6.65	7.28	6.33	7.10	7.19	58.17
66	6.92	7.46	7.81	7.23	7.97	8.21	64.96

NDP = Not Delinquency Prone

Table 3

Analyses of Variance and Means for Teacher Grades, STEP Scores, and Ra
Graduating Class For High and Low KD Scale Scorers

Source	Teacher Grades						STEP Scores		
	df	English	Science	Mathe-matics	Social Studies	df	Reading	Writing	Social Studies
1 - KD	1	0.48	1.77	1.35	2.63	1	4.31 *	1.07	0.77
2 - Sex	1	17.70 **	3.72	5.06 *	4.45 *	1	2.17	16.14 **	0.01
1 x 2	1	0.29	3.57	4.14 *	3.78	1	3.84	7.10 **	4.20 *
Error Mean Square	193	105.91	105.05	101.60	112.75	108	109.87	83.32	127.18
Group	N	Mean	Mean	Mean	Mean	N	Mean	Mean	Mean
DPM	44	1.94	1.84	1.70	1.83	23	39.61	26.52	39.61
DPF	57	2.64	2.39	2.32	2.44	32	46.53	38.22	44.34
NDPM	51	2.13	2.32	2.18	2.38	30	47.87	33.20	42.37
NDPF	45	2.67	2.32	2.20	2.40	27	47.00	35.63	38.30
DP	101	2.34	2.15	2.05	2.17	55	43.64	33.33	42.36
NDP	96	2.38	2.32	2.19	2.39	57	47.46	34.35	40.44
M	95	2.04	2.10	1.96	2.13	53	44.28	30.30	41.17
F	102	2.65	2.36	2.26	2.42	59	46.75	37.03	41.58

** Significant at .01 level
* Significant at .05 level
M = male, F = female; DP = delinquency prone; NDP = Not delinquency prone
1 These means are for ranks; they were converted from the analyses with arcsin values.

Table 3

for Teacher Grades, STEP Scores, and Rank in
or High and Low KD Scale Scorers

		STEP Scores						
l es	df	Reading	Writing	Social Studies	Science	Mathe-matics	df	Out of School Ss - Original 9th Graders
3	1	4.31 *	1.07	0.77	0.76	2.87	1	27.55 **
5 *	1	2.17	16.14 **	0.01	4.06 *	4.77 *	1	5.84 *
8	1	3.84	7.10 **	4.20 *	7.73 **	4.87 *	1	3.04
5	108	109.87	83.32	127.18	80.75	59.16	93	0.12
n	N	Mean	Mean	Mean	Mean	Mean	N	Mean[1]
3	23	39.61	26.52	39.61	33.04	23.78	23	26.30
4	32	46.53	38.22	44.34	34.44	23.88	27	50.67
8	30	47.87	33.20	42.37	36.57	29.67	25	68.12
0	27	47.00	35.63	38.30	28.44	23.30	22	71.09
7	55	43.64	33.33	42.36	33.85	23.84	50	39.46
9	57	47.46	34.35	40.44	32.72	26.65	47	69.51
3	53	44.28	30.30	41.17	35.04	27.11	48	48.08
2	59	46.75	37.03	41.58	31.69	23.61	49	59.84

P = Not delinquency prone
rom the analyses with arcsin values.